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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,081	05/03/2006	Sverker Hartwig	AC-110	4774
2529	7590	07/15/2011	EXAMINER	
MARK P. STONE 400 Columbus Avenue Valhalla, NY 10595			ANDRISH, SEAN D	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/578,081

Applicant(s)

HARTWIG ET AL.

Examiner

SEAN ANDRISH

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 - 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No.(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No.(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1 - 7, 10 - 17, and 20 - 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Underground Drilling and Loading Handbook - Tamrock; Tamrock Corp. 1997 (Tamrock).

Regarding claims 1, 11, and 21, Tamrock discloses a rock drilling apparatus comprising: a main power supply means for supplying power for the rock drilling process, which includes at least the sub-processes of flushing (pg. 38) and at least one of percussion (pg. 34) and rotation (pgs. 36 - 37), the method comprising the steps of: adjusting flush power directly in dependence on a value representing hole depth (page 38, paragraph 2); and controlling the flush power and at least one of the percussion power and rotational power (page 32, paragraph 3) such that total power consumption of each sub-process is controlled. Tamrock teaches optimizing power

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consumption (rock breakage efficiency) by optimizing the load on the bit (percussion), bit rotation, and flushing. Tamrock fails to disclose adjusting flush power during the actual drilling of the hole. Tamrock teaches adjusting a parameter (feed force) during the actual drilling process (page 35, second paragraph) and it would have been considered obvious to one of ordinary skill in the art to adjust other parameters, such as flush power, during the actual drilling of the hole to optimize power consumption during the drilling process. Furthermore, Tamrock teaches that in long-hole drilling the drilling direction has a large impact on the required water consumption. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have adjusted flush power during the actual drilling process to minimize water consumption.

Regarding claims 2 and 12, Tamrock further discloses flush power is at least partly adjusted as a function of hole diameter (hole size) (pg. 38, paragraph 2).

Regarding claims 3, 13, 22, and 23, Tamrock discloses all of the claim limitation(s) except for explicitly teaching power output is kept at or below a predetermined level. It would have been considered obvious to maintain power output at or below a predetermined level to reduce the operational costs of the drilling operation.

Regarding claims 4 and 14, Tamrock further discloses flow of the flush medium is substantially constant (page 38, paragraph 3).

Regarding claims 5, 15, 24, and 25, Tamrock further discloses the flow of the flush medium is increased with increasing hole depth (compensating for air pressure loss with increasing hole depth) (page 38, paragraph 3).

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Regarding claims 6, 7, 16, and 17, Tamrock further discloses continuous measurement of hole depth and flow of flush medium (page 38, paragraphs 2 and 3; Table 3-2).

Regarding claims 10 and 20, Tamrock further discloses a hydraulic top hammer (page 34, column 2).

4. Claims 8, 9, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamrock in view of Hobhouse (3,550,697).

Regarding claims 8 and 18, Tamrock discloses all of the claim limitation(s) except for computer means. Hobhouse teaches determining flush power requirements by computer means (column 3, lines 11 - 14), and it would have been considered obvious to use a known data processing system such as a computer to perform the computational analysis required to determine flush power requirements.

Regarding claims 9 and 19, Tamrock discloses all of the claim limitation(s) except for computer means connected to a memory containing stored data comprising lists at least partly including hole depth, type of drill bit, and type of drill rod. Hobhouse teaches computer means are connected to a memory containing stored data related to hole depth (column 2, lines 47 - 51), the computer means being used to adjust drilling speed, torque, weight-on-bit, and the associated required mud-flush. It would have been considered obvious to use a known data processing system such as a computer having memory containing stored data related to hole depth to perform the computational analysis required to determine flush power requirements.

#### ***Response to Arguments***

5. Applicant's arguments filed 09 May 2011 have been fully considered but they are not persuasive.

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Applicant argues that Tamrock teaches the optimization of flushing, not flush power. Applicant explains that flushing can be optimized without adjusting the flush power. Examiner replies that although flushing can be optimized without adjusting the flush power, flushing can also be optimized by adjusting the flush power. Since the adjustment of flush power is an obvious means by which flushing may be optimized, it would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have optimized flushing through the adjustment of flush power to meet the design needs of a given application.

Applicant argues that Tamrock teaches optimizing percussion force, bit rotation, and flushing, and not controlling the percussion power, rotational power, and flush power. As discussed above with respect to the optimization of flushing, the adjustment of power required for each of the sub-processes is an obvious means by which percussion force, bit rotation, and flushing may be optimized.

Applicant argues that Tamrock fails to disclose controlling the flush power and at least one of the percussion power and rotational power such that total power consumption of each sub-process is controlled. Examiner notes that Tamrock teaches optimizing percussion force, bit rotation, and flushing, as discussed above. The optimization of flushing, by means of the adjustment of flush power, would result in controlling the total power consumption for the flush power sub-process because the control of power consumption is an important, if not essential, component of operational efficiency. A similar rationale is used with regards to the optimization of percussion power and rotational power. Examiner also notes that the claims do not require simultaneous control of each of the sub-processes.

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Applicant disagrees with the examiner's conclusion that since Tamrock teaches adjusting one parameter (feed force) during the actual drilling process it would have been obvious to adjust other parameters, such as flush power, during the actual drilling. Applicant states that since the Tamrock publication fails to teach or suggest that flush power and feed force/feed pressure are related in any manner, Tamrock would not teach or suggest to one of ordinary skill in the art to adjust flush power if or when adjusting the feed force during actual drilling. Examiner referred to the adjustment of feed force as an example of the adjustment of power consumption of a sub-process. The fact that Tamrock does not teach flush power and feed force are related is irrelevant. Examiner's point is that if one parameter (i.e. flush power) is adjusted during drilling, it would have been obvious to optimize other parameters during the drilling process, regardless of whether or not adjustments of other sub-processes were made at the same time. Additionally, examiner refers applicant to the discussion above regarding the obviousness of adjusting flush power during the drilling process (emphasis added) to optimize flushing.

Applicant argues that Tamrock teaches pre-setting flush power prior to actual drilling of a hole. Examiner finds no such teaching in the Tamrock publication. To the contrary, Tamrock teaches that the drilling direction has a large impact on the required water consumption during a long-hole drilling process (pg. 38, column 2). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have adjusted flush power during the actual drilling process to minimize water consumption.

### ***Conclusion***

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6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN ANDRISH whose telephone number is (571)270-3098. The examiner can normally be reached on Mon - Fri, 7:30am - 5:00pm, Alternate Fri off, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on (571) 272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David J. Bagnell/  
Supervisory Patent Examiner, Art Unit 3672

SDA  
7/11/2011